Small Scale Resource Recovery

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Recycling is being touted by the general population as the answer to our solid waste problem. Most of us in this room know that there is no one answer to the solid waste problem. We are however aware that recycling can and does have a very significant effect in terms of reducing the amount of waste. If secondary materials industries did not exist, we could easily have twice the amount of waste that we currently dispose.

Waste Management magazines are currently full of stories about new and innovative approaches to the recycling question. Most of these stories are written about the very large scale projects; Kitchener/Waterloo, Mississauga, Ottawa/Carlton, etc. Very little is heard about recycling efforts in smaller communities or in rural areas. Recovery of resources from smaller communities presents an entirely different challenge to the resource recovery industry.

Alberta has long been involved with the recycling program in small communities. In many ways small communities represent the cornerstone of the Alberta program. To understand why this has developed, one must first look at the province of Alberta.

Alberta has a population base of somewhere over 2.2 million people. One half reside in the two major centres of Edmonton and Calgary. Another 200,000 live in smaller cities (Red Deer, Lethbridge, Grande Prairie, Medicine Hat, etc.). The rest are spread in a large number of smaller communities throughout the province, or in rural areas. In other words about 40% of the population live outside of a major urban area. Obviously for the province to be effective in the recovery of resources, then the development of methods to collect material from smaller centres would be necessary. In addition, because 40% of the population resides outside of major urban areas, it seemed logical that 40% of material that could be recovered from municipal solid waste was going to be outside the major urban areas.

Recovery of material from smaller communities faces different problems than recovery from larger centers. In Alberta, the smaller communities tend to be fairly far apart. This makes transportation to markets expensive. In many cases in rural Alberta, the single biggest cost faced by communities collecting materials for recycling, is transportation to market.

In addition, the waste management system typically used by smaller communities are quite different. There is not the diversity of equipment often associated with larger centres. Often few people are specialized in the waste removal. In many smaller centres garbage collection and disposal, is just part of the normal work done by the town or village foreman and his assistant. Many Alberta communities, no longer have their own landfill (or more commonly called a dump), but dispose of their waste at a transfer station and then to a regional landfill site which may be a fair distance from the community.

Outside of the towns and villages, collection is very rare. Normally the farmer hauls his own material, or dispose of it on site. Burning barrels are not uncommon in rural Alberta.

On the plus side, because the communities are smaller, promotion of the recycling projects is much simpler. Word of mouth advertising works extremely well. As such there is often not the high costs associated with promoting recycling projects, as is necessary in larger communities. There also tends to be a higher level of support for these projects than one would experience in the larger urban areas.

What are some of the lessons we have learned from setting up recycling systems in smaller communities?

First, and most important, the project should be set up to suit the community. In other words the systems often vary from community to community. Factors such as the demographics of the community, geography, people operating the projects, involvement of the municipality, etc., all have an effect and must be considered.

As an example two projects in different areas of the province are contrasted. In one community (a small centre of about 3,000 people in the southern part of the province), a service club operates a program to collect a number of different commodities including cardboard. While most of these commodities are collected by a drop off system at their recycling centre, cardboard is collected by the club picking up cardboard from high volume generators in the town. The cardboard is then baled, and shipped to market.

In another community (a community of approximately 2,500 in the northern part of the province), a different service club also collects cardboard. In conjunction with the town, they have placed a number of containers throughout

the retail portion of the town, for the cardboard to be placed in. These containers are emptied on a routine basis by the town, using their waste collection equipment. The cardboard is then dumped on the floor of the transfer station operated by the service club. Since the material is indoors, the cardboard can then be baled at the convenience of the club. Both projects generate large quantities of cardboard, although they utilize substantially different approaches.

In many cases, the largest single cost in running many recycling centres in smaller communities, is transportation to market. We have learned to address that issue first, to minimize those costs, and build the rest of the program around it. The transportation system in Alberta includes many small carriers working out of smaller communities, and hauling from the major centres to the smaller centres.

This has made the used of backhauls in many cases very feasible. The province has responded to this situation by utilizing normal transport equipment in recycling projects. For instance one typical project for the collection of newsprint and cardboard utilizes older but still serviceable highway trailers to collect the material in. The trailer can be thought of as a rolling storage shed. The newspaper is collected over a period of time. When it is full, the trailer is picked up by the transporter to haul the trailer to market, and backhauls his own goods to the community. This has aided a number of projects in obtaining very reasonable (sometime free) transportation rates.

Second of all, what would appear to be the most economic is not always. While we often think of hauling the largest volume possible, there are often times small messenger companies commuting back and forth to the major centers

on almost a daily basis using relatively small vehicles (8 - 14 foot vans). Often these companies are quite happy to haul small volumes at a time with little associated transportation costs.

The advantage to this method of transportation is that smaller volumes take less time to load and unload, and therefore the total downtime is cut down. At times smaller messenger firms, will transport these small volumes at no cost, as long as they do not have to spend a great time either loading or unloading. In all cases, the object is to minimize transportation costs.

A good example of how such a project is built around transportation relates to a project baling of cardboard. The analogy is simple. If transportation is free, and frequent, why go to all the trouble and expense of baling cardboard. A transporter can be simply loaded with bulk cardboard and dropped off at the market. If however, transportation costs are high, then obviously you transport as much weight as possible. In these cases baling becomes a necessity.

It is of course important in all cases to give recognition to the transport company for the work they have done.

Thirdly, because of the longer transport distances, and smaller volumes, recycling programs in smaller communities are generally more expensive to run. This means that the material must be collected in the cheapest way possible. Often times it is necessary to trade-off incremental volumes of material for reduction in collection costs. This generally means that collection systems must be either manned or unmanned drop off systems. It is possible, given the right circumstances, to consider curbside collection systems in small communities, but these are relatively rare.

A good example of where a high level of service can be operated with relatively small increase in cost, is the village of Riley. The village of Riley operates Alberta's first composting project. Residents of the village, are asked to place their organic material from kitchens and grass clippings and garden waste into biodegradable plastic bags. This material is then placed into a large collection container, which is taken out for collection the same day as normal garbage collection. The town collection vehicle makes two separate passes. On one pass, it collects garbage, on the second pass, it collects the compost. The compost is transferred to a central point, where it is shredded and stockpiled for composting. In this particular case we were able to offer the residents of Riley the service associated with the curbside program because, we were able to utilize the garbage collection vehicle for both processes. Since the garbage collection vehicle was used on average one half to 3/4 of the day per week the additional cost of collection for composting, was minimal. As a general rule, this level of service could only be operated in small communities when the circumstances are similar to those of the village of Riley.

Most collection systems for recycling in rural Alberta are of the unmanned drop-off variety. While this is the lowest level of service possible, it is compensated by a higher level of participation in such projects in smaller communities than in the larger urban centres.

To further illustrate the difference between collections from larger centres and collections from smaller centres I wish to discuss the development of Alberta's Oil Drop Program.

Used lubricating oil is a significant problem. The 1974 Synergy West Study projected that 30 million gallons of oil are sold in Alberta annually. Of this 55 to 60% or approximately 15 to 18 million gallons was potentially collectable. There is more used lubricating oil generated in the province each year than all other hazardous wastes combined.

There are also two re-refiners in the province; Hub Oil in Calgary, and Turbo Resources in Edmonton. They are the largest users of used lubricating oil in the province. Between them they produce somewhere between 7 and 9 million gallons of re-refined base stock each year. There are some additional small uses; road oiling, burning, etc.; but these are minimal.

In the urban areas, the service stations and other large generators of oil have underground tanks to collect used lubricating oil. Typically these tanks are demanded by Municipal Sewage by-laws.

The service stations and other large users have traditionally provided a ready source of product for the re-refiners.

However, there is a very significant source of used lubricating oil that is largely untouched. This is the DIY (or do it yourself) market. Estimates on the DIY market range from 15% to 50% depending upon the nature of the community, and the season. Obviously the DIY market was a very significant source for the generation of used lubricating oil.

The solution to provide a collection system for the DIY market was fairly straight forward. Since the service stations already had tanks, it seemed logical for oil from the DIY market to flow to those tanks. We simply went out and asked service stations if they would be prepared to take used lubricating oils back.

Quite frankly, we were overwhelmed with the result. Over half of all the

service stations asked agreed. All service stations participating in the program get a distinctive black and gold decal which they place in their window, indicating this as an oil drop station. The province keeps track of the service stations involved, and advertises the program. There are over 300 service stations in Alberta participating in the program.

However, the situation in rural Alberta was quite different. First of all service stations in rural Alberta did not always have tanks. It was not uncommon to find oil disposed of on the lot of the service station. The little oil collected, was generally collected in small containers, and taken off the local landfill or dump. Second, the do it yourself market changes quite drastically in rural Alberta. The agricultural community is a major user of used lubricating oil, and most farmers still continue to change their own oil. The amounts of oil generated by some larger equipment are substantial. Some sumps on larger tractors will hold 5 to 10 gallons of oil at a time. Most farmers maintain a 45 gallon drum where they place all of their used lubricating oil. Even if service stations did have tanks, it would be a hardship for them to accept 45 gallons of oil at a time.

The solution involved the establishment of a network of tanks throughout the province. These tanks are generally of 5000 to 7000 gallons in capacity. The tanks are sized so that it is economical for a re-refinery to come in and collect oil from them. These tanks are placed in a multitude of locations from County yards to regional landfills. We have found that it is best to put them into a location where they are "perceived" to be supervised.

Some of these tank systems have had very active collection systems established with them. Others are very passive systems, and allow people a place to dump their oil. Some are a combination of both. One collection

program established in conjunction with a tank, generated in excess of 1500 gallons of oil per month, out of a population base of approximately 10,000.

In either case, the systems established for one sector would not work well for the other. It would be foolish to try and get service stations in rural Alberta to accept back the oil from rural Alberta, especially when farmers do generate a large amount of oil per capita. Buy the same token, the establishment of tanks in something like the city of Edmonton would be foolish because of the large number of tanks that would be required to make it convenient for people to bring their oil there. Each system has to be set up to deal with the population it is serving.

I realize that I have just skimmed the surface on the development of recycling systems for rural communities. I would be pleased to answer any questions that you would have.